



49 CFR Part 236 - Subpart H
Standards for Development and Use of Processor-Based
Signal and Train Control Systems
“A PTC Facilitator”

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I have an announcement to make!



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The Problem:

Ever-Changing Technological Environment and the desire to facilitate PTC

Traditional Environment

- Static Technology
- Fixed Hardware-Driven Implementation
- Relatively “Simple” Functionality/A more Prescriptive Regulation

Today's Environment

- Rapidly Changing Technology
- Changeable Software-Driven Implementation
- Relatively “Complex” Functionality/A more Performance-based Regulation

**TECHNOLOGY CHANGING FASTER
THAN THE REGULATIONS COULD KEEP UP!**



The Solution: The Railroad Safety Advisory Committee (RSAC)

Result: 49 CFR Part 236 - Subpart H
Standards for Development and Use of Processor-Based Signal and
Train Control Systems (commonly termed the PTC Rule)

➤ A Performance-Based Rulemaking

➤ Technology Neutral

➤ Risk-Driven Requirements



Subpart H Performance-Based Standard

The Bottom Line:

“The system/product must be at least as safe as what was
there before”

AND

“You have to demonstrate that what you say is true.”



Key Elements:

- Configuration Management Control Plan
- Railroad Safety Program Plan (RSPP)
Formal document describing railroad's strategy for addressing safety hazards associated with the operation of products under this subpart
- Product Safety Plan (PSP)
Formal document which describes in detail all of the safety aspects of a specific product to be deployed
- Minimum Performance Standards
- FRA Review and Approvals of RSPP's and PSP's
- Implementation and Operation
- Retention of Records
- Operations and Maintenance Manuals
- Training and Qualification Programs
- Appendix A – Civil Penalty Schedule
- Other Appendices



Summary of Regulatory Impacts

Existing Relay or Installed Processor-based Technology

- No Changes
- Existing Signal Inspection Act Remains in Effect

Highway-rail Grade Crossing Warning Systems

- New or Novel Technologies Fall Under Subpart H
- Any Highway-rail Grade Crossing Warning System that Interfaces with a Signal or Train Control System Falls under Subpart H



Summary of Regulatory Impacts

Configuration Management Control Plans

- Requirement for **ALL** Railroads to Develop and Implement For **ALL** Signal and Train Control Systems
- Phased Implementation (General Case)
 - 6 Months to Develop Plan
 - 30 Months to Implement Plan

Processor and Communication-Based Operating Architectures

- Full Safety Case Development
 - New or Novel Technologies
 - New or Significant Functionality Changes
- Abbreviated or No Safety Case Development
 - Technology Refresh
 - Minor Functionality and Patches/Changes



FRA Office of Safety Role

“We’re from the Government and We’re Here to Help”

Pre-Approval Regulation

Are you at least as safe as you were before?

- Does the safety case convince a reasonable decision-maker (FRA)?

Post-Approval Compliance

- Are you complying with the assumptions and conditions in the safety case?
 - Do those assumptions and conditions REALLY reflect what occurs when the system is used?
- Are you adhering to your PSP?



What we can do....

- Provide Technical Assistance on the Rule Process
 - Participate as an Observer in Your Design and Development Process to Facilitate Review and Approvals
 - Provide Test Monitors to Support System Testing before PSP Approval
 - Provide Technical Applications of the Rule
 - Provide Guidance on Previous Safety Board Decisions In Similar Situations where Applicable

What we can not do....

- Provide Design Review or Analysis Services
 - Provide Technical Approvals of Designs
 - Provide Legal Interpretations of the Rules

(See Our Lawyers!!!!!!)



With Current Technology PTC Is Not Cost Effective In Terms of Safety Benefit Alone....

20 year life cycle cost	Implementation <u>Cost</u>	Safety <u>Benefit</u>	Benefit <u>Cost Ratio</u>
Basic PTC	\$1,163M	\$485M	0.42
Basic PTC + Digital Authorities	\$2,912M	\$502M	0.17
Basic PTC + Digital Authorities + Wayside Switch Monitoring	\$5,667M	\$539M	0.10
Basic PTC + Digital Authorities + Wayside Switch Monitoring + Signals, Other Warning Devices, & Track Force Terminals	\$7,797M	\$844M	0.09

...But the Rule Supports Implementing
New PTC Technologies and Concepts
To Change the Balance



Some Points of Contact

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